UDC Appendix

Table of Contents

Chapter 20	
Sample Forms	3
Chapter 21	
Sanitary Permit Requirements	13
Fastener Schedule	14
Use of Span & Species Tables	16
Span & Species Tables	22
Handrail Diagrams	47
Erosion Control Diagrams	48
Frost-Protected Shallow Footings	66
Chapter 22	
Energy Worksheet Example	68
Sample Energy Worksheet Form	74
Default Assembly R & U-Value Tables	82
Typical Thermal Properties of Building Materials	91
Slab-On-Grade Insulation Details	91
UDC Inspection Checklist	93
UDC Index	99

-2004 - App - 3-

Wisconsin Division of Safety and Buildings				CONSIN U	NIFORM I APPLICAT		ING		A	Application No.				
Wisconsin Stats. 101.63,	101.73		s on bac	k of yellow p	ly. The information programs (Priva	tion you pr				arcel N	lo.			
PERMIT REQUE	STED	_			Electric \square P					trol	Othe			
Owner's Name	SILD			ailing Address		ramomę	<u>, </u>	10510	<i>7</i> 11 CO11	101	Tel.			
Contractor's Name: □Co	n □Elec □	HVAC □ Pl	bg Lie	c/Cert#	Mailing Ad	ldress					Tel.			
											FAX			
Contractor's Name: □Co	n □Elec □	HVAC □PI	hg Lio	c/Cert#	Mailing Ad	ldress					Tel.			
eomaco o rumae.					in wining i to						FAX			
Contractor's Name: □Co	n □Elec □	HVAC □ Pl	bg Lie	c/Cert#	Mailing Ad	ldress					Tel.			
											FAX			
Contractor's Name: □Co	n □Elec □	HVAC □Pl	bg Lie	c/Cert#	Mailing Ad	ldress					Tel.			
											FAX			
PROJECT LOCATION	Lot area		Sq. ft.				of S	ection		, T	N,	R	E (or) W	V
Building Address		St	ıbdivisio	on Name				Lot	No.		Blo	ck No.		
Zoning District(s)	Zoning Po	ermit No.			Setbacks:	Front	ft.	Rea	r fi	Le	ft	ft.	Right	ft.
1. PROJECT	3. OCCUP		_	ECTRICAL	9. HVAC EQU				Y SOUR	CE	0.1	•	0.111	
☐ New ☐ Repair ☐ Alteration ☐ Raze	☐ Single F☐ Two Far		Amps	nce Panel	☐ Forced Air F ☐ Radiant Base		Fue Space		Nat Gas	LP	Oil	Elec	Solid	Solar
□ Addition □ Move	□ Garage		□ Un	derground	☐ Heat Pump		Water	Htg						
☐ Other:	☐ Other:			erhead	☐ Boiler ☐ Central Air (73			unit has 3					
2. AREA INVOLVED	4. CONST	. TYPE	_	UNDATION ncrete	☐ Other:	ona.			. Infiltrati wer door					
Unfin.	☐ Site-Bui	lt	☐ Ma	sonry			_		OSS (Cal					
BsmtSq Ft		UDC □ HUD		ated Wood	10. SEWER									
Living	5. STORII	ES	□ Oth		☐ Municipal		Envelo	ppe					BTU	/HR
AreaSq Ft	☐ 1-Story ☐ 2-Story		8. US	sonal	☐ Septic Permi	t No.:	Infiltra	ntion					BTU	/HR
GarageSq Ft	☐ Other:			manent	11. WATER				ILDING	COST				71110
	□ Plus Bas	am ant	□ Oth	ner:	☐ Municipal U		¢							
DeckSq Ft. I agree to comply with all approximately seed to comply seed to comply with all approximately seed to comply se			ordinance	es and with the c			\$	at the i	ssiiance o	f the ne	ermit er	eates no	legal lial	hility
express or implied, on the sta I have read the cautionary sta authorized agent, permission	te or municipatement regar to enter the p	pality; and certi ding contractor premises for wh	fy that all financial	I the above infor I responsibility of	rmation is accurate on the reverse side	e. If I am ar of the pink	n owner a ply. I ex	applyin pressly per pui	g for an e grant the pose to in	rosion of building	control ng inspe he work	or constructor, or a which i	ruction p the inspe is being o	ector's done.
APPLICANT'S SIG	NATUR								TE SI					
APPROVAL CONI	OITIONS	This pern permit or			ne following cond	itions. Failu	ire to coi	nply m	ay result	in suspe	ension o	r revoca	tion of th	his
ISSUING JURISDICTION	□ Town	□ Village		City	state of:			Munici	pality Nu	mber o	f Dwell:	ng Loca	tion	
		n	Г РМІТ	(S) ISSUED	WIS PERMIT S	EFAT #	DEDM	T ICC	UED BY:				-	
FEES: Plan Review \$			Consti		WISTERWIII	DEAL #	I EKIVI	1133	OED DY					
Inspection \$			HVAC	C			Name_							
Wis. Permit Seal \$ Other \$			☐ Electri ☐ Plumb											
\$			∃ Piumo ∃ Erosio				Date _			161				
Total \$		_	Cert No								_			

INSTRUCTIONS

The owner, builder or agents shall complete the application form down through the Signature of Applicant block and submit it and building plans and specifications to the enforcing municipality. Permit application data is used for statewide statistical gathering on new one- and two-family dwellings, as well as for local code administration.

PERMIT REQUESTED

- Check off type of Permit Requested, such as structural, HVAC, Electrical or Plumbing.
- Fill in owner's current Mailing Address and Telephone Number.

PROJECT LOCATION

- Fill in Building Address (number and street or sufficient information so that the building inspector can locate the
 construction site.
- Fill in Contractor Information. Note, per s. 101.63 (7) Wis. Stats., that the master plumber name and number must be entered before issuing a plumbing permit.
- Local zoning, land use and flood plain requirements must be satisfied before a building permit can be issued. County approval may be necessary.
- Fill in Zoning District, lot area and required building setbacks.

PROJECT DATA - Fill in all numbered project data blocks (1-14) with the required information. All data blocks must be filled in, including the following:

2. Area (involved in project):

Basements - include unfinished area only

Living area - include any finished area including finished areas in basements

Two-family dwellings - include total combined areas

- 3. Occupancy Check only "Single-Family" or "Two-Family" if that is what is being worked on. In other words, do not check either of these two blocks if only a new detached garage is being built, even if it serves a one or two family dwelling. Instead, check "Garage" and number of stalls. If the project is a community based residential facility serving 3 to 8 residents, it is considered a single-family dwelling.
- 9. HVAC Equipment Check only the major source of heat, plus central air conditioning if present. Only check "Radiant Baseboard or Panel" if there is no central source of heat.
- 10. Plumbing A building permit cannot be issued until a county sanitary permit has been issued for any new of affected existing on-site sewage system.
- 14. Estimated Cost Include the total cost of construction, including materials and market rate labor, but not the cost of land or landscaping.

SIGNATURE - Sign and date this application form.

CONDITIONS OF APPROVAL - The authority having jurisdiction uses this section to state any conditions that must be complied with pursuant to issuing the building permit.

ISSUING JURISDICTION: This must be completed by the authority having jurisdiction.

- Check off Municipality Status, such as town, village or city.
- Fill in Municipality Name and Municipality Number of inspection authority.
- Fill in Municipality Number of Dwelling Location if different from municipality where inspection authority is located. (applies to county or state enforcement)
- Check off type of Permit Issued, such as construction, HVAC, electrical or plumbing.
- Fill in Wisconsin Uniform Permit Seal Number, if project is a new one- or two-family dwelling.
- Fill in Name and Inspector Certification Number of person reviewing building plans and date building permit issued.

PLEASE RETURN YELLOW COPY WITHIN 30 DAYS AFTER ISSUANCE TO (You may fold along the dashed lines and insert this form into a window envelope.):

Safety & Buildings Division P O Box 2509 Madison, WI 53701-2509

CAUTIONARY STATEMENT TO OWNERS OBTAINING BUILDING PERMITS

101.65(lr) of the Wisconsin Statutes requires municipalities that enforce the Uniform Dwelling Code to provide an owner who applies for a building permit with a statement advising the owner that:

If the owner hires a contractor to perform work under the building permit and the contractor is not bonded or insured as required under s. 101.654 (2) (a), the following consequences might occur:

- (a) The owner may be held liable for any bodily inquiry to or death of others or for any damage to the property of others that arises out of the work performed under the building permit or that is caused by any negligence of the contractor that occurs in connection with the work performed under the building permit.
- (b) The owner may not be able to collect from the contractor damages for any loss sustained by the owner because of a violation by the contractor of the one- and 2- family dwelling code or an ordinance enacted under sub. (1) (a), because of any bodily injury to or death of others or damage to the property of others that arises out of the work performed under the building permit or because of any bodily injury to or death of others or damage to the property of others that is caused by any negligence by the contractor that occurs in connection with the work performed under the building permit.

	SITE IN	FO			ot proceed until the insperiod since notification	* *	_	
SUBDIVISION				of issuance if	the building's exterior s been made. (WI State	has not been complete		
LOT NO.	BLOCK N	NO		-	· ·	·		
ZONING DISTRICT				WISC	ONSIN U	NIFORM	l	
1/4, 1/4				DI				affix uniform permit seal here (when applicable)
PARCEL NOSETBACKS: FRONT				В				Seal No
LEFT	ft RIGHT _		ft					
IN	NSPECTI	IONS		P	RRI		1 **	
PHASE FOOTING	ROUGH	FINAL	EROSION					
FOUNDATION				□ cons	st	ec bi	umb ∐er	osion
BSMT DRAIN TILES						P		OSIOII
CONSTRUCTION				Pre				
PLUMBING								
HEAT/VENT/AC				ss e	OW AGENT)			
ELECTRICAL					BUILDING SITE ADDRES	SS		
INSULATION				το				
OCCUPANCY					CITY, VILLAGE, TOWN			
	CONT	RACT	ORS		Issued	PERSON ISSUING	C	ERT. NO.
	G.C.		#		by	DATE ISSUED	TELEPHONE	
	HVAC		# #		Commen	ts:		
	ELECT.		#					
	PLBG.		#			OMPLIANCE: This issuit corrected. All cited violati		

SBD-5824 (R. 05/96)

-2004 - App - 7-

INSPECTION REPORT AND NOTICE OF NONCOMPLIANCE

Report Date:		Inspection Date		Permit No.:		Par	cel No:		
Project Address				Subdivision		Lot	No.:	Block No.:	
	oting eat/Vent/AC	☐ Erosion Control ☐ Plumbing		Foundation Electrical	n		Drain Tile tion/Energy	☐Construction☐Occupancy	
Type(s)	au venuAC			<u>Елеситсат</u>			uton/Energy	<u></u> Оссирансу	
Owner:				Contractor	:				
					4				
AN INSPECTION OF T	THE ABOVE PR	REMISES HAS D	ISCLOSED	THE FOLL		JCOM	IPLIANCES:		
ORDER CODE	SECTION			FI DI) j		EQUIF	REMENTS		
		$\times Q \parallel$							
NOTICE OF NOVCO		ANT: Please rep	port when v	violation are	e corrected	. AVO	ID DELAY		
NOTICE OF NONCOMAll cited violations shall be continues after notice sha	e corrected with							ach day that the violat	tion
			City	- Jiiouics all			y By Municipal Ord		
=	=	State OF	•						
Inspector's Name:			Violations I	Explained To:	_		Compliance Date	:	
				,					
Inspector's Address:					Office Hour	rs:	Telephone No:		

DO NOT REMOVE

SBD-10266 (N.10/95)

OFFICIAL MUNICIPAL NOTICE OF VIOLATION

LOCATION:			
□ LACKING	PERMIT(S)	□ NEED FOR	INSPECTION
		□ PREMISES HOU	
☐ UNFIT FOR HUMAN OC			
☐ EROSION CONTROL PE] MAINTAIN
□ ROCK DRIVEWAY □ IN			
☐ SEDIMENT CLEANUP ☐	☐ STREET & SIDE	WALL	IG PROPERTY
OTHER:		I A H I	
	T A		
ACTION:			
□ CONTACT IN PECT		FTER CORREC	TIONS
□ CORRECT □ AQV	END OF	ΓODAY(TRACKIN	IG CLEANUP)
□ BY END (X			NUP)
□ IN 72 HRS (£ROS)	ION CONTROL	S) 🗆 BY	
□ STOP ALL WORK □	EXCEPT COR	RECTIONS	
FAILURE TO COMPLY SUI	BJECTS YOU TO A	APPLICABLE FINES	& PENALTIES
MUNICIPAL INSPECTOR		PHONE NUMBER	DATE

Safety and Buildings Division 201 W. Washington Avenue P O Box 7162 Madison, WI 53707-7162 Telephone: (608) 266-3151

PETITION FOR VARIANCE INFORMATION AND INSTRUCTIONS - ILHR 3

In instances where exact compliance with a particular code requirement cannot be met or alternative designs are desired, the Division has a petition for variance program where it reviews and considers acceptance of alternatives which are not in strict conformance with the letter of the code, but which meet the intent of the code. A variance is not a waiver from a code requirement. The petitioner must provide an equivalency which meets the intent of the code section petitioned to obtain a variance. Documentation of the rationale for the equivalency is requested below. Failure to provide adequate information may delay your petition. Pictures, sketches, and plans may be submitted to support equivalency. If the proposed equivalency does not adequately safeguard the health, safety, and welfare of building occupants, frequenters, firefighters, etc., the variance request will be denied. NOTE: A SEPARATE PETITION IS REQUIRED FOR EACH BUILDING AND EACH CODE ISSUE PETITIONED (i.e., 57.13 window issue cannot be processed on the same petition as 51.16 stair issue). It should be noted that a petition for variance does not take the place of any required plan review submittal.

The Division is unable to process petitions for variance that are not properly completed. Before submitting the application, the following items should be checked for completeness in order to avoid delays:

- Petitioner's name (typed or printed)
- Petitioner's signature
- The Petition For Variance Application must be signed by the owner of the building or project unless a Power of Attorney is submitted.
- Notary Public signature with affixed seal
- Analysis to establish equivalency, including any pictures, illustrations or sketches of the existing and proposed conditions to clearly convey your proposal to the reviewer.
- Proper fee
- Any required position statements by fire chief or municipal official

A position statement from the chief of the local fire department is required for fire safety issues.

No position statement is required for non-fire safety topics such as sanitary and energy conservation. Position statements for both the fire department and municipality are required for ILHR 69 barrier-free petitions. For rules relating to one- and two-family dwellings, only a position statement from the local enforcing municipality is required. Position statements must be completed and signed by the appropriate fire chief or municipal enforcement official. See the back of SBD-9890, Petition For Variance Application form for these position statement forms. Signatures or seals on all documents must be originals. Photocopies are not acceptable.

Contact numbers and fees for the Division's review of the petition for variance are as follows:

Chapters ILHR 20-25, Uniform Dwelling Code(608) 267-5113	\$125.00
Chapters ILHR 67-68, Rental Unit Energy Efficiency Code (608) 266-1930	\$125.00
Chapters ILHR 50-64, Commercial Building Code(608) 266-1835	\$490.00
Chapter ILHR 66, Uniform Multi-Family Dwellings(608) 266-0669	\$490.00

 The cities of Milwaukee and Madison may process requests for variances from Chapters ILHR 50 through 64 requirements on projects in their jurisdiction.)

Chapter ILHR 66, Multifamily Dwelling	(608) 266-1930	\$490.00
Chapter ILHR 69, Barrier-Free Requirements	(414) 548-8609\$	200.00
Chapter ILHR 70, Historic Building Code	(715) 524-3626	\$300.00
All Other Chapters		\$200.00

Boilers and Pressure Vessels	(414) 548-8617
Electrical	(608) 266-7529
Elevators	(414) 521-5444
Flammable Liquids	(608) 266-7529

Priority Review: Does not apply to Uniform Dwelling Code or Historic

Double

Building Code issues which already are treated as a priority. ... Above Amounts

Except for special cases, the Division will review and make a determination on a petition for variance within 30 business days of receipt of all calculations, documents, and fees required for the review. Uniform Dwelling Code petitions will be processed within 5 business days. Priority petitions will be processed within 10 business days.

Petitions for variance should be submitted to:

Safety and Buildings Division 201 West Washington Avenue P O Box 7162 Madison, Wisconsin 53707 (608) 266-3151

Elevator or barrier-free petitions may be submitted directly to the Waukesha office.

General Plumbing or Private Sewage petitions may be submitted to any of the six full-service offices.

GREEN BAY S&BD 2331 San Luis Place Green Bay, WI 54304 920-492-5601 FAX: 920-492-5604 **HAYWARD S&BD** 15837 USH 63 Hayward, WI 54843 715-634-4870 FAX: 715-634-5150

LACROSSE S&BD 2226 Rose Street La Crosse, WI 54603 608-785-9334 FAX: 608-785-9330 MADISON S&BD 201 W. Washington Ave. P.O. Box 7162 Madison, WI 53707-7162 608-261-8490

FAX: 608-267-9566

SHAWANO S&BD 1340 Green Bay St Shawano, WI 54166 715-524-3626 FAX: 715-524-3633 **WAUKESHA S&BD**401 Pilot Court
Waukesha, WI 53188
414-548-8600
FAX: 414-548-8614

SBD-9890 (R.01/98)

Dept. Use Only Plan No.

-2004 - App - 11- **PETITION FOR VARIANCE APPLICATION**

Safety and Buildings Division 201 W. Washington Ave. P.O. Box 7162 Madison. WI 53707 Page 1 of

PLEASE TYPE OR PRINT CLEAR	RLY - Personal inf	formation you provide ma	y be used for sec	ondary purposes [Privacy	Law, s.15.04 (1)(m)].	
1. Owner Information	2. Pr	oject Information		3. Designer Inform	ation	
Name	Buildir	ng Occupancy Chapter(s)	and Use	Designer	Registration No.	
Company Name	Tenan	t Name (if any)		Design Firm		
Number and Street	Buildir	ng Location (number and	street)	Number and Street		
City, State, Zip Code	С	ity Village To	ownship of	City, State, Zip Code		
Contact Person	County	y of		Contact Person	_	
Telephone Number FAX Number	Proper	rty ID # (tax parcel # - cor	ntact county)	Telephone Number	FAX Number	
4. Plan Review Status	☐On hold		☐Already b	nuilt	/	
Review by State Municipality Plan Number 5. State the code section being per	☐Preliminary d ☐Approved, red ☐Submitted with	questing revision th petition	□Built acco brought □Plan will □Other	ording to older code bu into compliance with cu be submitted after peti	urrent code tion determination	
6. Reason why compliance with the second se					ressed by the code	
section petitioned.			- C			
List attachments to be considerexpert opinion, previously appropriate to be considered.				ode sections, test repor	ts, research articles,	
VERIFICATION BY OWNER - PETITI Section Comm 2.52 for complete to Note: Petitioner must be the owner petition unless Power of Att Petitioner's Name (type or print)	fee information) er of the building torney is submitte, being	or project. Tenants, and with the Petition for duly sworn, I state as	gents, designer Variance Applic petitioner that I	s, contractors, attorney cation.	rs, etc., shall not sign	
Petitioner's Signature		Subscribed and sworn to before me this date	Notary Public		My commission expires on	

-2004 - App - 12-

Owner's Name	Project Location	<i>y</i>	Plan Number
SBD-9890 (R.01/98)	L		
Page 2 of	Eiro Donartmont Bo	osition Statom	ant.
To be completed for va	Fire Department Po ariances requested from ILHF requirem	R 50-64, ILHR 69,	ILHR 10, and other fire related
Approval Co	ation for variance and reco	mmend: (check a Denial	lo Comment
suggested conditions:			
Fire Department Name and Addre			
Name of Fire Chief or Designee (type or print)		Telephone Number
Signature of Fire Chief or Designe	эе		Date Signed
To be completed for	•	HR 20-23. Also to he building under	
I have read the applica	case ation for variance and recoi	mmend: (check a	
• •	onditional Approval on including any conflicts with local rules		lo Comment uggested conditions:
Municipality Exercising Jurisdiction	on		
Name and Address of Municipal (Official (type or print)	Telephone	Number of Enforcement Official
Signature of Municipal Enforcement	ent Official	Date Signe	ed .

SBD-9890 (R.01/98)

-2004 - App - 13-SANITARY PERMIT REQUIREMENTS

Section Comm 20.09 (5) (b) 3. refers to s. Comm 83.25 (2), which reads as follows:

Comm 83.25 (2) Issuance of Building Permits. (a) *General*. Pursuant to s. 145.95, Stats., the issuance of building permits by a municipality for unsewered properties shall be in accordance with this subsection.

- (b) New construction. A municipality may not issue a building permit to commence construction or installation of a structure that necessitates the use of a POWTS to serve the structure, unless:
 - 1. The owner of the property possesses a sanitary permit for the installation of a POWTS in accordance with s. Comm 83.21; or **Note:** Section Comm 83.21 outlines the procedures for the issuance of sanitary permits. Sections 145.135 and 145.19, Stats., mandate that no private sewage system may be

installed unless the owner of the property holds a valid sanitary permit.

2. A POWTS of adequate capability and capacity to accommodate the wastewater flow and contaminant load already exists to serve the structure.

Note: See ss. Comm 83.02 and 83.03 concerning the application of current code requirements to existing POWTS.

- (c) Construction affecting wastewater flow or contaminant load. 1. A municipality may not issue a building permit to commence construction of any addition or alteration to an existing structure when the proposed construction will modify the design wastewater flow or contaminant load, or both, to an existing POWTS, unless the owner of the property:
 - a. Possesses a sanitary permit to either modify the existing POWTS or construct a POWTS to accommodate the modification in waste-water flow or contaminant load, or both; or
 - b. Provides documentation to verify that the existing POWTS is sufficient to accommodate the modification in wastewater flow or contaminant load, or both.
 - 2. For the purpose of this paragraph, a modification in wastewater flow or contaminant load shall be considered to occur:
 - a. For commercial facilities, public buildings, and places of employment, when there is a proposed change in occupancy of the structure; or the proposed modification affects either the type or number of plumbing appliances, fixtures or devices discharging to the system; and
 - b. For dwellings, when there is an increase or decrease in the number of bedrooms.
- (d) *Documentation of existing capabilities*. Documentation to verify whether an existing POWTS can accommodate a modification in wastewater flow or contaminant load, or both, shall include at least one of the following:
 - 1. A copy of the plan for the existing POWTS that delineates minimum and maximum performance capabilities and which has been previously approved by the department or the governmental unit.
 - 2. Information on the performance capabilities for the existing POWTS that has been recognized through a product approval under ch. Comm 84.
 - 3. A written investigative report prepared by an architect, engineer, designer of plumbing systems, designer of private sewage systems, master plumber, master plumber–restricted service or certified POWTS inspector analyzing the proposed modification and the performance capabilities of the existing POWTS.
- (e) Setbacks. 1. A municipality may not issue a building permit for construction of any structure or addition to a structure on a site where there exists a POWTS, unless the proposed construction conforms to the applicable setback limitations under s. Comm 83.43 (8) (i).
 - 2. The applicant for a building permit shall provide documentation to the municipality issuing the building permit showing the location and setback distances for the proposed construction relative to all of the following:
 - a. Existing POWTS treatment components.
 - b. Existing POWTS holding components.
 - c. Existing POWTS dispersal components.

Note: A municipality which issues building permits may delegate to the governmental unit responsible for issuing sanitary permits the determination of whether the proposed

construction will affect or interfere with an existing POWTS relating to capability or location of the existing POWTS.

*-2004 - App - 14-*MINIMUM FASTENER SCHEDULE TABLE

Other interior and exterior panel products and finishes installed per manufacturer requirements. For engineered connectors, use manufacturer's specified fasteners.

Description of Building Materials/Connection	Number and Type of Fastener ^{1 2 3}
Floor Framing	
Joist to joist, face nailed over support	2-12d
Joist to sill or girder, toe nail	2-16d, 3-8d
Band or rim joist to joist, end nail	3-16d
Band or rim joist to sill or top plate	2-16d at 16" o.c.
Bridging to joist, toe nail each end	2-8d
Built-up girder and beams, top loaded	10d at 32" o.c. at top and
	bottom and staggered and two
	at ends and at each splice
Built-up girder and beams, side-loaded	16d at 16" o.c. at top and
	bottom and staggered and two
	at ends and at each splice
Ledger strip to beam, face nail	3-16d each joist
Joist on ledger to beam, toe nail	3-8d
Wall Framing	
Sole plate to joist or blocking, face nail	16d at 16" o.c.
Top or sole plate to stud, end nail	2-16d
Stud to sole plate, toe nail	4-8d or 3-16d
Doubled studs, face nail	16d at 24" o.c.
Doubled top plates, face nail	16d at 16" o.c.
Top plates, laps and intersections, face nail	2-16d
Continuous header, two pieces	16d at 16" o.c. along each edge
Continuous header to stud, toe nail	4-8d
1" corner brace to each stud and plate, face nail	2-8d or 2 staples, 1 3/4"
Built-up corner studs	16d at 30" o.c., 16d at 24" o.c.
Roof/Ceiling Framing	
Ceiling joists to plate, toe nail	2-16d, 3-8d
Ceiling joist, laps over partitions, face nail	3-16d
Ceiling joist to parallel rafters, face nail	3-16d
Rafter to plate, toe nail (maximum 6' rafter span,	2-16d, 3-8d
engineered connector for longer)	
Roof rafters to ridge, valley or hip rafters, toe nail	4-16d
Roof rafters to ridge, valley or hip rafters, face nail	3-16d
Collar ties to rafters, face nail	3-8d
Boards and planks	
1" x 6" subfloor or less to each joist, face nail	2-8d or 2 staples, 1 3/4"
Wider than 1" x 6" subfloor toe to each joist, face nail	3-8d or 4 staples 1 3/4"
2" subfloor to joist or girder, blind and face nail	2-16d
1" x 6" roof sheathing to each bearing, face nail	2-8d or 2 staples, 1 3/4"
1" x 8" roof sheathing to each bearing, face nail	2-8d or 3 staples, 1 3/4"
Wider than 1" x 8" roof sheathing to each bearing, face nail	3-8d or 4 staples, 1 3/4"
2-inch planks	2-16d at each bearing

Panel Sheathing						
		Spacin	g of Fastener			
Material	Fastener	Edges	Intermediate Supports			
Engineered wood panel						
for subfloor and roof						
sheathing and wall corner						
wind bracing to framing						
5/16-inch to 1/2-inch	6d common or deformed nail or staple, 1 1/2"	6"	12" 4			
5/8-inch to 3/4-inch	8d smooth or common, 6d deformed nail, or staple, 14 ga. 1 ³ / ₄ "	6"	12" 4			
7/8-inch to 1-inch	8d common or deformed nail	6"	12"			
1 1/8-inch to 1 1/4-inch	10d smooth or common, or 8d deformed nail	6"	12"			
Combination subfloor/						
underlayment to framing						
3/4-inch or less	6d deformed or 8d smooth or common nail	6"	12"			
7/8-inch to 1-inch	8d smooth, common or deformed nail	6"	12"			
1 1/8-inch to 1 1/4-inch	10d smooth or common or 8d deformed nail	6"	12"			
Wood panel siding to						
framing						
1/2-inch or less	6d corrosion-resistant siding and casing nails	6"	12"			
5/8-inch	8d corrosion-resistant siding and casing nails	6"	12"			

¹All nails are smooth-common, box or deformed shank except where otherwise stated
²Nail is a general description and may be T-head, modified round head or round head.
³Staples are 16-gauge wire, unless otherwise noted, and have a minimum 7/16-inch o.d. crown width.
⁴Staples shall be spaced at not more than 10 inches o.c. at intermediate supports for floors.

UDC Floor & Ceiling Joist and Roof Rafter Span Tables And Design Value Tables

Use the following Span Tables to determine the maximum spans for floor and ceiling joists and roof rafters. These spans are based on:

- simple, single spans (although the tables may be safely used for continuous two-span floor joists)
- uniformly distributed loads
- fully supported members with one edge properly sheathed and nailed
- for floor joists and roof rafters, the top edge shall be properly sheathed and nailed

The criteria for each Span Table is given in the upper left hand corner and is also summarized in the table of Span Tables below. Choose the appropriate Span Table based on the member type and required loading. Select your desired member depth, member spacing and span to determine the minimum Fb value. Note that these tables include recommended deflection criteria. However, for strict code compliance, only the Fb strength requirements must be satisfied. The modulus of elasticity (E) values, would be met for serviceability purposes only.

Note that straight-line interpolation is permitted for intermediate spans and design values. Span is measured from face to face of supports plus one-half of the required bearing of 1.5" on wood or metal and 3" on masonry or concrete at each end. For sloping rafters, the span is measured along the horizontal projection.

Section Comm 21.27 allows reduction of the snow live load for roof slopes greater than 30 degrees (7/12 slope) based on the formula Cs = 1 - (a-30)/40, where "a" is the slope of the roof expressed in degrees. Following is a table of tabulated values for certain roof slopes.

Slope	Angle in Degrees	Zone 1 Live	Zone 2 Live
		Load (psf)	Load (psf)
7/12	30	40	30
10/12	40	30	22.5
12/12	45	25	18.8
14/12	50	20	15

Use the Design Value tables following the Span Tables to determine the acceptable species and grades to satisfy minimum Fb values obtained from the Span Tables. The Design Value tables assume at least three members spaced no more than 24" on center. Use the Normal Duration column Fb values for joists and the Snow Loading column Fb values for rafters.

See the following examples for further guidance.

7F 1 1	• 4 1	4	c			0	T)	·
I ables are	renrinted	COURTES	Λŧ.	A merican	Horest A	Kτ	Paner	Association.
I abics aic	i cpi iiitcu	courtesy	UI A	American	I OI CSL	•	1 apci	1 1330Clation.

Table	Member	Live	Dead	Condition	(Deflection)*
No.	Type	Load	Load		
		(psf)	(psf)		
F-2	Floor Joists	40	10	-	L/360
C-1	Ceiling Joists	10	5	Drywall ceiling, no attic storage	L/240
C-2	Ceiling Joists	20	10	Attic storage	L/240
R-2	Roof Rafters	30	10	Maximum 2 layers of asphalt	L/240
		(Zone 2)		shingles or wood shakes/shingles	
R-3	Roof Rafters	40	10	Maximum 2 layers of asphalt	L/240
		(Zone 1)		shingles or wood shakes/shingles	
R-10	Roof Rafters	30	20	Heavy roof covering (clay tile)	L/240
		(Zone 2)			
R-11	Roof Rafters	40	20	Heavy roof covering (clay tile)	L/240
		(Zone 1)			
R-14	Roof Rafters	30	10	Maximum 2 layers of asphalt	L/180
		(Zone 2)		shingles or wood shakes/shingles	
R-15	Roof Rafters	40	10	Maximum 2 layers of asphalt	L/180
		(Zone 1)		shingles or wood shakes/shingles	
R-22	Roof Rafters	30	20	Heavy roof covering (clay tile)	L/180
		(Zone 2)			
R-23	Roof Rafters	40	20	Heavy roof covering (clay tile)	L/180
		(Zone 1)			

^{*}Deflection criteria are optional. For roof rafters with drywall on the underside, use the stricter L/240 tables to limit deflection.

Example 1. Floor Joists. Assume a required single span of 12'-9", dead load of 10 psf and joists spaced 16 inches on center. Table F-2 (see following highlighted tables) shows that one solution is a grade of 2x8 having an Fb value of 1255 would allow a span of 12'-10 which satisfies the condition. (Note that the recommended E value to limit deflection would be 1,600,000.) Going to the Design Value Tables, we find that as an example, 2x8 Hem Fir grade No.1 has an Fb value of 1310 for normal duration. (It also has an E value of 1,500,000 which does not satisfy the recommended deflection criteria.)

Example 2. Rafters. Assume a horizontal projected span of 13'-0", a live load of 40 psf, dead load of 10 psf, a roof slope of 4/12 and rafters spaced 16 inches on center. Since the slope is shallower than 7/12, there is no allowable reduction of the snow live load. Table R-3 shows that a 2x8 having an Fb value of 1300 would allow a span of 13'-1" which satisfies the condition. (Note that the recommended E value to limit deflection would be 1,120,000.) Going to the Design Value Tables, we find that as an example, 2x8 Douglas Fir-Larch grade No.2 has an Fb value of 1390 for snow loading. (It also has an E value of 1,600,000 which satisfies the recommended deflection criteria.)

Example 1 TABLE F- 2 FLOOR JOISTS WITH L/360 DEFLECTION LIMITS

DESIGN CRITERIA:

Deflection - For 40 psf live load. Limited to span in inches divided by 360. Strength - Live load of 40 psf plus dead load of 10 psf determines the required bending design value.

Joist Size	Spacing		Modulus of Elasticity, E, in 1,000,000 psi															
(in)	(in)	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4
	12.0	8-6	8-10	9-2	9-6	9-9	10-0	10-3	10-6	10-9	10-11	11-2	11-4	11-7	11-9	11-11	12-1	12-3
	16.0	7-9	8-0	8-4	8-7	8-10	9-1	9-4	9-6	9-9	9-11	10-2	10-4	10-6	10-8	10-10	11-0	11-2
2x 6	19.2	7-3	7-7	7-10	8-1	8-4	8-7	8-9	9-0	9-2	9-4	9-6	9-8	9-10	10-0	10-2	10-4	10-6
	24.0	6- 9	7- 0	7-3	7-6	7-9	7-11	8-2	8-4	8- 6	8-8	8-10	9- 0	9- 2	9- 4	9- 6	9- 7	9-9
	12.0	11-3	11-8	12- 1	12-6	12-10	13-2	13-6	13-10	14-2	14- 5	14-8	15-0	15-3	15-6	15-9	15-11	16-2
	16.0	10-2	10-7	11-0	11-4	11-8	12-0	12-3	12-7	12-10	13-1	13-4	13-7	13-10	14- 1	14-3	14-6	14-8
2x 8	19.2	9-7	10-0	10-4	10-8	11-0	11-3	11-7	11-10	12-1	12-4	12-7	12-10	13-0	13-3	13-5	13-8	13-10
	24.0	8-11	9-3	9-7	9-11	10-2	10-6	10-9	11-0	11-3	11-5	11-8	11-11	12-1	12-3	12-6	12-8	12-10
	12.0	14- 4	14-11	15- 5	15-11	16- 5	16-10	17-3	17- 8	18- 0	18- 5	18- 9	19- 1	19- 5	19- 9	20- 1	20-4	20-8
	16.0	13-0	13-6	14- 0	14- 6	14-11	15-3	15-8	16-0	16- 5	16-9	17-0	17-4	17-8	17-11	18-3	18-6	18-9
2x10	19.2	12-3	12-9	13-2	13-7	14-0	14- 5	14-9	15- 1	15- 5	15-9	16-0	16-4	16-7	16-11	17-2	17-5	17-8
	24.0	11-4	11-10	12-3	12-8	13-0	13-4	13-8	14- 0	14- 4	14- 7	14-11	15-2	15- 5	15-8	15-11	16-2	16- 5
	12.0	17-5	18-1	18-9	19-4	19-11	20-6	21-0	21-6	21-11	22-5	22-10	23-3	23-7	24-0	24- 5	24-9	25-1
	16.0	15-10	16-5	17-0	17-7	18-1	18-7	19- 1	19-6	19-11	20-4	20-9	21-1	21-6	21-10	22-2	22-6	22-10
2x12	19.2	14-11	15-6	16-0	16-7	17-0	17-6	17-11	18-4	18- 9	19-2	19-6	19-10	20-2	20-6	20-10	21-2	21-6
	24.0	13-10	14- 4	14-11	15-4	15-10	16-3	16-8	17- 0	17- 5	17- 9	18- 1	18- 5	18-9	19- 1	19- 4	19-8	19-11
F_b	12.0	718	777	833	888	941	993	1043	1092	1140	1187	1233	1278	1323	1367	1410	1452	1494
F_b	16.0	790	855	917	977	1036	1093	1148	1202	1255	1306	1357	1407	1456	1504	1551	1598	1644
F_b	19.2	840	909	975	1039	1101	1161	1220	1277	1333	1388	1442	1495	1547	1598	1649	1698	1747
F _b	24.0	905	979	1050	1119	1186	1251	1314	1376	1436	1496	1554	1611	1667	1722	1776	1829	1882

Note: The required bending design value, F_b, in pounds per square inch is shown at the bottom of each table and is applicable to all lumber sizes shown. Spans are shown in feet-inches and are limited to 26' and less. Check sources of supply for availability of lumber in lengths greater than 20'.

*-2004 - App - 19-***Example 1**

Example 1												
Species and Grade	Size	Design V		Modulus	Grading							
		Bending	g, "Fb"	of	Rules							
		Normal	Snow	Elasticity "E"	Agency							
		Duration	Loading	F								
Eastern White Pine	1		1		Ì							
Select Structural		2155	2480	1,200,000								
No.1		1335	1535	1,100,000								
No.2		990	1140	1,100,000								
No.3	2x4	605	695	900,000								
Stud		570	655	900,000								
Construction Standard		775 430	895 495	1,000,000 900,000								
Utility		200	230	800,000								
Select Structural		1870	2150	1,200,000								
No.1		1160	1330	1,100,000								
No.2	2x6	860	990	1,100,000								
No.3		525	600	900,000								
Stud		520	595	900,000	NELMA							
Select Structural		1725	1985	1,200,000	NSLB							
No.1	2x8	1070	1230	1,100,000								
No.2		795	915	1,100,000								
No.3		485	555	900,000								
Select Structural		1580	1820	1,200,000								
No.1	2x10	980	1125	1,100,000								
No.2		725	835	1,100,000								
No.3		445	510	900,000								
Select Structural		1440	1655	1,200,000								
No.1	2x12	890	1025	1,100,000								
No.2		660	760	1,100,000								
No.3		405	465	900,000								
Hem Fir	_				İ							
Select Structural		2415	2775	1,600,000								
No.1 & Btr		1810	2085	1,500,000								
No.1		1640	1885	1,500,000								
No.2	24	1465	1685 990	1,300,000								
No.3 Stud	2x4	865 855	990	1,200,000 1,200,000								
Construction		1120	1290	1,300,000								
Standard		635	725	1,200,000								
Utility		290	330	1,100,000								
Select Structural		2095	2405	1,600,000								
No.1 & Btr		1570	1805	1,500,000								
No.1	2x6	1420	1635	1,500,000								
No.2		1270	1460	1,300,000								
No.3		750	860	1,200,000								
Stud		775	895	1,200,000								
Select Structural		1930	2220	1,600,000	WCLIB							
No.1 & Btr		1450	1665	1,500,000	WWPA							
No.1	2x8	1310	1510	1,500,000								
No.2		1175	1350	1,300,000								
No.3		690	795	1,200,000								
Select Structural		1770	2035	1,600,000								
No.1 & Btr		1330	1525	1,500,000								
No.1	2x10	1200	1380	1,500,000								
No.2		1075	1235	1,300,000								
No.3		635	725	1,200,000								
Select Structural		1610	1850	1,600,000								
No.1 & Btr		1210	1390	1,500,000								
No.1	2xl2	1095	1255	1,500,000								
N. 2		980	1125	1,300,000								
No.2 No.3		575	660	1,200,000								

Example 2 TABLE R-3 RAFTERS WITH L/240 DEFLECTION LIMITATION

DESIGN CRITERIA:

Strength - Live Load of 40 psf plus

Dead Load of 10 psf determines the required bending design value.

Deflection - For 40 psf live load.

Limited to span in inches divided by 240.

										Ra	ıfter	Bending	g Design	Value,	F _b , (psi)									
Size (in)		Spacing (in)	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
2x	6	12.0 16.0 19.2 24.0	5-6 4-9 4-4 3-11	6- 4 5- 6 5- 0 4- 6	7-1 6-2 5-7 5-0	7-9 6-9 6-2 5-6	8-5 7-3 6-8 5-11	9- 0 7- 9 7- 1 6- 4	9-6 8-3 7-6 6-9	10- 0 8- 8 7-11 7- 1	10- 6 9- 1 8- 4 7- 5	11- 0 9- 6 8- 8 7- 9	11- 5 9-11 9- 1 8- 1	11-11 10-3 9-5 8-5	12- 4 10- 8 9- 9 8- 8	12-8 11-0 10-0 9-0	13- 1 11- 4 10- 4 9- 3	13-6 11-8 10-8 9-6	13-10 12-0 10-11 9-9	14- 2 12- 4 11- 3 10- 0	12-7 11-6 10-3	12-11 11- 9 10- 6	12- 0 10- 9	12- 4 11- 0
2x	8 1	12.0 16.0 19.2 24.0	7-3 6-3 5-9 5-2	8- 4 7- 3 6- 7 5-11	9-4 8-1 7-5 6-7	10- 3 8-11 8- 1 7- 3	11- 1 9- 7 8- 9 7-10	11-10 10-3 9-4 8-4	12- 7 10-10 9-11 8-11	13-3 11-6 10-6 9-4	13-11 12- 0 11- 0 9-10	12-7	15-1 13-1 11-11 10-8	13-7 12-5	16-3 14-0 12-10 11-6	16- 9 14- 6 13- 3 11-10	17-3 14-11 13-8 12-2	17- 9 15- 5 14- 0 12- 7	18-3 15-10 14-5 12-11	18-9 16-3 14-10 13-3	16- 7 15- 2 13- 7	17- 0 15- 6 13-11	15-10 14- 2	16-3 14-6
2x	10	12.0 16.0 19.2 24.0	9-3 8-0 7-4 6-6	10- 8 9- 3 8- 5 7- 7	11-11 10- 4 9- 5 8- 5	13- 1 11- 4 10- 4 9- 3	14- 2 12- 3 11- 2 10- 0	15- 1 13- 1 11-11 10- 8	16- 0 13-10 12- 8 11- 4	16-11 14- 8 13- 4 11-11	17- 9 15- 4 14- 0 12- 6	18- 6 16- 0 14- 8 13- 1	19-3 16-8 15-3 13-7	17-4 15-10	20- 8 17-11 16- 4 14- 8	21- 4 18- 6 16-11 15- 1	22- 0 19- 1 17- 5 15- 7	22- 8 19- 7 17-11 16- 0	23-3 20-2 18-5 16-6	23-11 20- 8 18-11 16-11	21-2 19-4 17-4	21- 8 19-10 17- 9	20- 3 18- 1	20- 8 18- 6
2x	12	12.0 16.0 19.2 24.0	11- 3 9- 9 8-11 7-11	13- 0 11- 3 10- 3 9- 2	14- 6 12- 7 11- 6 10- 3	15-11 13-9 12-7 11-3	17- 2 14-11 13- 7 12- 2	18- 4 15-11 14- 6 13- 0	19- 6 16-10 15- 5 13- 9	20-6 17-9 16-3 14-6	21-7 18-8 17-0 15-3	22-6 19-6 17-9 15-11	23-5 20-3 18-6 16-7	21-1 19-3	25- 2 21- 9 19-11 17- 9	26- 0 22- 6 20- 6 18- 4	23- 2 21- 2 18-11	23-10 21-9 19-6	24- 6 22- 5 20- 0	25- 2 23- 0 20- 6	25- 9 23- 6 21- 1	24- 1 21- 7	24- 8 22- 0	25-2 22-6
E E E E	1 1	12.0 16.0 19.2 24.0	0.14 0.12 0.11 0.10	0.22 0.19 0.18 0.16	0.31 0.27 0.24 0.22	0.41 0.35 0.32 0.29	0.51 0.44 0.41 0.36	0.63 0.54 0.50 0.44	0.75 0.65 0.59 0.53	0.88 0.76 0.69 0.62	1.01 0.88 0.80 0.71	1.15 1.00 0.91 0.81	1.30 1.12 1.03 0.92	1.45 1.26 1.15 1.03	1.61 1.39 1.27 1.14	1.77 1.54 1.40 1.25	1.94 1.68 1.54 1.37	2.12 1.83 1.67 1.50	2.30 1.99 1.81 1.62	2.48 2.15 1.96 1.75	2.31 2.11 1.89	2.48 2.26 2.02	2.42 2.16	2.58 2.30

Note: The required modulus of elasticity, E, in 1,000,000 pounds per square inch is shown at the bottom of each table, is limited to 2.6 million psi and less, and is applicable to all lumber sizes shown. Spans are shown in feet-inches and are limited to 26' and less. Check sources of supply for availability of lumber in lengths greater than 20'.